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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/756,876

01/13/2004

Christian T. Goralski JR.

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06/30/2008

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EXAMINER

NGUYEN, TU MINH

ART UNIT

PAPER NUMBER

3748

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/756,876	<b>Applicant(s)</b> GORALSKI ET AL.	
	<b>Examiner</b> TU M. NGUYEN	<b>Art Unit</b> 3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 April 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-7 and 17-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-7 and 17-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 October 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. An Applicant's Request for Continued Examination (RCE) and an Applicant's Amendment filed on April 18, 2008 have been entered. Claims 3 and 8-14 have been canceled; claims 1 and 2 have been amended; and claims 17-19 have been added. Overall, claims 1, 2, 4-7, and 17-19 are pending in this application.

### ***Drawings***

2. The formal drawings filed on October 13, 2007 have been approved for entry.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**4. Claims 1, 4-7, and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Poggio et al. (U.S. Patent 6,226,982) in view of Sawada et al. (U.S. Patent 5,970,707).**

Re claims 1 and 17, as shown in Figures 1-3 and indicated in the Abstract, Poggio et al. disclose a method for controlling an engine having an exhaust with an emission control device (6) adapted for storing oxygen during lean operating conditions, and converting at least a portion of the oxygen during stoichiometric or rich operating conditions, the method comprising:

- operating (during fuel cut-off operating condition) the engine to produce a lean exhaust gas mixture fed to the emission control device; and

- after the lean operation, operating the engine to produce a rich exhaust gas mixture fed to the emission control device, the rich exhaust gas mixture having a rich air-fuel ratio, wherein the rich air-fuel ratio is selected as a function of at least the oxygen storage capacity of the device and temperature of the device, wherein the rich air-fuel ratio decreases with decreasing oxygen storage capacity to a greater extent at higher temperatures than lower temperatures (see at least Figure 3, lines 9-23 of column 6, and lines 41-49 of column 6).

Poggio et al., however, fail to disclose that the emission control device is a NO<sub>x</sub> trap adapted for storing NO<sub>x</sub> during lean operating conditions, and converting at least a portion of the NO<sub>x</sub> during stoichiometric or rich operating conditions.

As shown in Figure 1, Sawada et al. disclose an exhaust gas purification device for an internal combustion engine, comprising a NO<sub>x</sub> trap (7). As indicated on lines 38-46 of column 2, Sawada et al. teach that the NO<sub>x</sub> trap is adapted to store NO<sub>x</sub> during lean operating conditions and to convert at least a portion of the NO<sub>x</sub> during stoichiometric or rich operating conditions. It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the NO<sub>x</sub> trap taught by Sawada et al. in the method of Poggio et al., since the use thereof would have been routinely practiced by those with ordinary skill in the art to effectively remove harmful NO<sub>x</sub> emissions in an exhaust gas stream.

Re claims 4 and 18, in the modified method of Poggio et al., the rich air-fuel ratio is selected to provide a select amount of CO and hydrogen.

Re claims 5-6 and 19, in the modified method of Poggio et al., the oxygen storage capacity of the device is determined based on device degradation (lines 24-32 of column 8),

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wherein the device degradation is based on at least one of an amount of sulfur contaminating the device and thermal degradation of the device.

Re claim 7, as taught in Sawada et al., in the modified method of Poggio et al., the oxygen storage capacity of the device is determined from rich to lean transition time (in Sawada et al., a rich to lean transition time (TSTL in Figure 6) is measured, which is then used in the routine in Figure 13 to compute a storage capacity (CATDOS) of the NO<sub>x</sub> trap).

**5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Poggio et al. in view of Sawada et al. as applied to claim 1 above, and further in view of Kakuyama et al. (U.S. Patent 6,619,032).**

The modified method of Poggio et al. discloses the invention as cited above, however, fails to disclose that the oxygen storage capacity of the device is based on an average of several rich to lean transition times.

As shown in Figure 1, Kakuyama et al. disclose an engine air-fuel ratio control based on an amount of oxygen stored in a catalytic converter device (3). As depicted in Figure 3 and indicated in the Abstract, lines 52-57 of column 5, and line 62 of column 7 to line 10 of column 8, Kakuyama et al. teach that it is conventional in the art to estimate an oxygen storage capacity of the device is estimated based on a temperature of the device; and that the oxygen storage capacity of the device is estimated based on an average of several rich to lean transition times. It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the teaching by Kakuyama et al. in the modified method of Poggio et al., since the use thereof would have been routinely practiced by those with ordinary skill in the art to control an engine air-fuel ratio based on a storage capacity of an emission control device.

***Prior Art***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and consists of three patents: Uchida (U.S. Patent 6,761,024), Miura et al. (U.S. Patent 7,275,363), and Enoki et al. (U.S. Patent 7,293,404) further disclose a state of the art.

***Communication***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (571) 272-4862.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TMN  
June 22, 2008

/Tu M. Nguyen/  
Tu M. Nguyen  
Primary Examiner  
Art Unit 3748